

DUAL HEATPIPE COOLED

(English)

850 WATT

MODULAR POWER SUPPLY

User's Manual

ZM850-HP



Please read this manual before installing

ZALMAN
COOL INNOVATIONS

1. Safety Precautions

- The following precautions and directions are measures against possible accidents and injuries. Please read them thoroughly before using this product.

Warning

Neglecting the following may cause serious injury or death.

- ▶ Opening the cover of the product while the power cord is plugged into an outlet may cause electrocution or critical damage to the product.
- ▶ Handling the power cord with wet hands may cause electrocution.
- ▶ Inserting fingers or metallic objects into the cooling fan may cause injury or electrocution.

Caution

Neglecting the following may cause minor injuries, degrade product conditions or cause malfunction.

- ▶ Operating the product in an extremely cold or hot environment can degrade product performance and lifespan.
- ▶ Liquids that enter the product may cause malfunction.
- ▶ Operating in a humid or non-ventilated environment may reduce product lifespan.

2. Components

- 1) One Power Supply
- 2) Two Cables for PCI-E2
- 3) Three Cables for ODD/HDD
- 4) Three Cables for S-ATA
- 5) One Fan Dual-Connector (ZM-DC1)
- 6) One Power Cord for AC Power Source (Not included in some countries)
- 7) One User's Manual
- 8) Five Cable Ties
- 9) Four Power Supply Installation Bolts

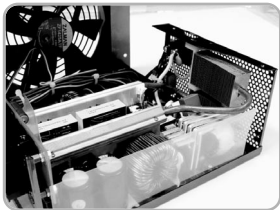
3. Notes on Installation

- ※ To ensure a safe and easy installation, please read the safety precautions above and the following notes.
- Plugging the main power connector P1 into the motherboard while the product is connected to the AC power source may cause damage to the motherboard.
 - Make sure that the connectors are connected to their designated locations, and that the connectors are not oriented in the wrong direction when connecting the DC output connectors.
 - If the Power ON LED fails to light up when the main power button is pressed after completing the installation procedure, some devices may be connected incorrectly or the motherboard may be faulty.

4. The Zalman Advantage

■ Dual Heatpipes Installed for Maximum Cooling Performance and Ultra-Quiet Operation

Dual heatpipes with ultra-high cooling performance incorporated on the main heat sources enable high load operation even at low fan RPM for a dramatic reduction in noise levels.



■ Improved Power Factor & Reduced Harmonics through Active PFC

By implementing Active PFC(Power Factor Correction), the Power Factor (PF) is improved up to 99% while harmful harmonic frequencies are reduced to meet the Line Harmonic Distortion Requirement of IEC61000-3-2 Class D Specification.

■ High Efficiency Design and 80 PLUS Certified

This power supply is capable of reaching a maximum of 86% efficiency (230VAC, Full & Typical Load) through its use of high switching frequency and low power-loss circuitry. This product has been certified with the 80 PLUS Power Supply Certification and guarantees a higher efficiency compared to uncertified products.

- × 80 PLUS is an innovative, electric utility-funded incentive program that strives to integrate more energy-efficient power supplies into desktop computers and servers.

■ ATX20+4 Pin Main Connector

ATX20+4 Pin Main Connector broadens the range of motherboard compatibility.

■ Supports ATX12V CPU 4-Pin and EPS12V CPU 8-Pin

Two ATX12V CPU 2 ×2 (4-Pin) power cables can be combined to form an EPS12V CPU 8-Pin power cable.

■ Four PCI Express VGA Power 6-Pin & 6+2 Pin Connectors

Four independent 6-Pin Power Connectors (two 6-pin & two 6+2 pin) provide support for Nvidia's Quad SLI and ATI's CrossFire.

■ Modular Cables

Modular cables provide organized cable management and improved air circulation inside the computer case.

■ Ultra Quiet 140mm Fan

The ultra quiet 2 ball-bearing 140mm fan maximizes the airflow and minimizes the noise level enabling a noiseless computing environment with optimized cooling.

■ Standby Noise Filter Switch

The 5Vsb Noise Filter eliminates high frequency noise in standby mode.

- × The Standby Noise Filter Switch is NOT a power switch. The AC Power Cord MUST be unplugged in order to turn the power supply OFF.

■ Six Independent +12VDC Outputs

Six +12VDC rails supply power independently to the CPU, VGA, motherboard, and peripheral components for the highest level of stability and performance.

■ EZ Grip Connectors for ODDs & HDDs

EZ Grip Connectors for easy removal of the plugs from ODDs & HDDs.

■ Gold-Plated Terminals & 16AWG Wires

All connector terminals are gold-plated to minimize contact resistance and power lose.

16AWG (thicker than 18AWG) wires are incorporated to minimize voltage drop during high load operation.

■ Sleeved Cables

All power cables are sleeved for easy cable management and improved air circulation inside the computer case.

■ Multiple Safety Features

Over-Voltage Protection, Over-Current Protection, Short-Circuit Protection, Under-Voltage Protection, Over-Temperature Protection.

■ WEEE & RoHS

Complies with WEEE & RoHS environmental directives of the European Union.

- × WEEE (Waste Electrical and Electronic Equipment)
- × RoHS (Restriction of Hazardous Substances)

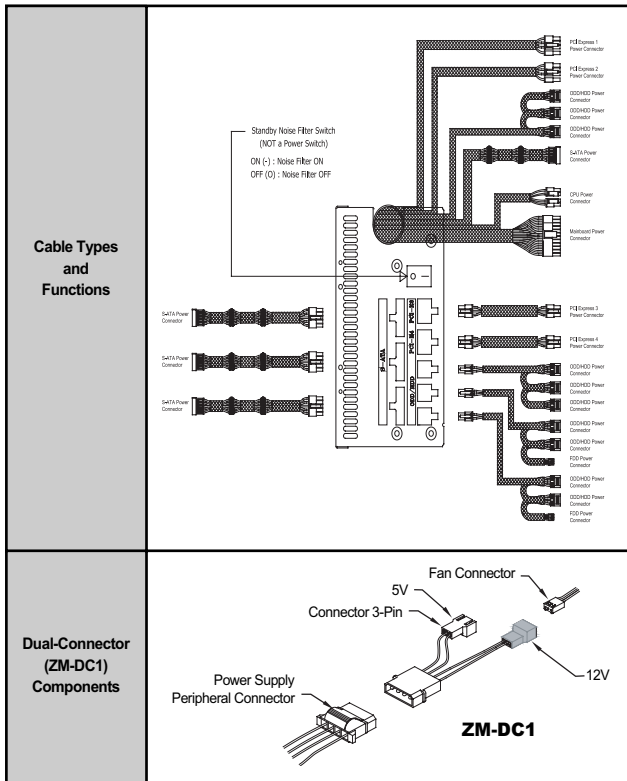
■ International Safety and EMC Certifications



ZMT-ZM850-HP(B)

5. Specifications

■ Output Power Cable Specifications



■ Electrical & Physical Characteristics

AC Input Range	Voltage	100VAC ~ 240VAC \pm 10%		DC Output					
	Frequency	47Hz ~ 63Hz		ZM850-HP					
AC Input Range (Rated)	115VAC	12A		Vout	Output Load Rating			Combined Power	
	230VAC	6.3A			I_{min}	I_{max}	I_{peak}		
PFC Type	Active PFC			+3.3V	0.8A	25A	35A	191W	
Power Factor	99% Maximum			+5V	0.5A	30A	35A		
Inrush Current Limit (@ Cold start at 25°C)	115VAC	60A		+12V1	0.5A	18A	22A	768W	
	230VAC	100A		+12V2	0.5A	18A	22A		
Efficiency	86% Max, @230VAC, Full & Typical load			+12V3	0.5A	28A	30A		850W
DC Output Voltage Regulations	Vout		Regulation Range		+12V4	0.5A	28A	30A	
	+3.3VDC	\pm 5%	+3.14V	~	+3.47V	+12V5	0.5A	18A	22A
	+5VDC	\pm 5%	+4.75V	~	+5.25V	+12V6	0.5A	18A	22A
	+12V1DC	\pm 5%	+11.4V	~	+12.6V	-12V	0.0A	0.8A	27.1W
	+12V2DC	\pm 5%	+11.4V	~	+12.6V	+5VSB	0.1A	3.5A	
	+12V3DC	\pm 5%	+11.4V	~	+12.6V	Protection			
	+12V4DC	\pm 5%	+11.4V	~	+12.6V	Over-Voltage Protection (OVP)			
	+12V5DC	\pm 5%	+11.4V	~	+12.6V	Over-Current Protection (OCP)			
	+12V6DC	\pm 5%	+11.4V	~	+12.6V	Under-Voltage Protection (UVP)			
	-12VDC	\pm 10%	-10.8V	~	-13.0V	Short-Circuit Protection (SCP)			
	+5VSB	\pm 5%	+4.75V	~	+5.25V	Over-Temperature Protection (OTP)			
	DC Output Ripple & Noise	Vout		Specification		Ambient Temperature			
+3.3VDC			50mV		Operation	0°C ~ +45°C			
+5VDC			50mV		Stored	-20°C ~ +60°C			
				Ambient Humidity					
+12V1&2DC			120mV		Operation	5%RH ~ 95%RH			
+12V3&4DC			120mV		Stored	5%RH ~ 95%RH			
+12V5&6DC			120mV		Dimensions				
-12VDC			120mV		210mm(L) * 150mm(W) * 86mm(H)				
+5VSB		50mV							

6. Zalman's CNPS (Computer Noise Prevention System) Products

For a stable and noiseless system of the highest quality, use Zalman's CPU Coolers, VGA Coolers, Heatpipe HDD Coolers and Northbridge Coolers.



Ultra Quiet CPU Cooler



Fanless VGA Cooler



Heatpipe HDD Cooler



Ultra Quiet CPU Cooler



Fanless Northbridge Cooler

7. Product Warranty (International)

Thank you for purchasing Zalman's product.

Warranty - If this product has any defects, then Zalman guarantees that it can be exchanged within three (3) years from the time of purchase.

※ Product exchange is done with the reseller where the product was purchased.

For further inquiries, contact Zalman Headquarters at www.zalman.co.kr or via e-mail to a representative.

There will be no exchanges in the following cases:

- A) Violation of the Safety Precautions and the Notes on Installation of this manual.
- B) Human fatality and/or property damage due to events of natural causes.
- C) External case damage, electrical problems, and damage to components caused by careless mishandling.

Disclaimer - Zalman Tech Co., Ltd. is not responsible for any damages due to external causes, including but not limited to, improper use, problems with electrical power, accident, neglect, alteration, repair, improper installation, or improper testing.

For Inquiries

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Disposal of Old Electrical & Electronic Equipment
(Applicable in the European Union and other European countries with separate collection systems)